

Why are Algerian Companies Unable to Innovate?

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Abstract

Since 1998-2011 of 22 August 1998 Algeria has invested more than ever in political, legal, financial and human resources to promote scientific research and technological development, and its corollary innovation, however two decades passed without concrete results. Is it an input problem? or is it a malfunction of the black box program (innovation system)?

Keywords:

Innovation • National system of innovation • Institutions

Introduction

Now, in the context of globalization and the fabulous breakthrough of science and technology which induces the life cycle of a product to shrink, geopolitics, prices of products and raw materials, variations in exchange rates and moreover, with an increasingly demanding and often militant and engaged consumer, even in the presence of a certain protectionism causes uncertainty, and consequently a strong pressure and especially a presentiment that everything will collapse at any moment. Thus, all companies, see that the ideas, the means and the solutions of yesterday will be obsolete tomorrow, and how many big companies have ceased to exist even if their stories were almost those of a thousand and one nights but the role of the main actor (innovation) was very brief. So perpetually innovating is synonymous with "existing" if it is not "surviving" [1].

But the landscape in Algeria indicates the opposite, and Algerian companies show a certain inertia and indifference towards innovation, very probably being aware of the gravity of the situation, especially preparing to join the WTO and seeing protectionist barriers fall one after the other. What is the problem?

The previous studies concerning the theme of innovation are very rare and confidential in Algeria, and do not satisfy the practical side, figures and the real problems in the field, and only give preliminary and hypothetical analyses on the question based on global data (the number of patents, absence of research center) because, of course, of the isolation of the Algerian company in the first place, and the hostility which reigns on the environment against the transparency

and the circulation of the information, therefore, where the exploratory character of this present study comes from.

And this study is based primarily on companies that want to innovate but have not been able, or which have innovated sporadically and want to have a certain consistency in this function [2].

Thus, we were able to draw from the situation two important hypotheses:

Almost total lack of innovation (especially concerning the product) at the level of Algerian companies (much more private).

The will to innovate is omnipresent, but the internal and external environment of the Algerian company is not conducive to the development of an innovation-oriented routine.

And this study is based on surveys, interviews mainly and some reports from the Ministry of Industry on the theme of innovation and related subjects.

Materials and Methods

Patents in Algeria

Patents grant the holder a monopoly on the exploitation of his invention for about twenty years and in defined countries. It constitutes both a deterrent against competition and a potential source of income; on the other hand the cost of its deposit is quite high (from € 5,000 to € 50,000 in Europe, depending on the duration,

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the complexity of the invention, and the place where the invention will be protected. In Algeria it is between 40,000 and 50,000 DA~250 and 350 €). The brand serves to individualize a product, and this distinctive sign constitutes the essential support for any advertising and plays an important role in the development of the market; there is an international classification of goods and services for the purposes of trademark registrations, and protection is renewable every ten years. And finally, the model concerns the new form given to a product; a successful aesthetic promotes the sale of a product; the laws protect models whose photographic reproduction is the subject of an official deposit with the institute responsible for industrial property [3].

In Algeria, it should be noted that 85% of patents concern inventions from individuals, but the degree of relevance of these inventions to the needs of companies in terms of innovation remains to be seen. And speaking of actual inventions these statistics are not very significant, because the patent application is expensive (universally) and its registration procedures are very long, up to two years, which dissuades any pretender to come close, and as a result, many inventors go and promote their inventions abroad. In addition to these downstream obstacles (manageable), there are more substantial upstream obstacles (structural and non-controllable) that affect serious valuation and consistent development of innovation [4]:

- The organization of the company and the associated value system do not encourage innovation; technicians and salespeople have little to gain from success, and have much to lose from failure.
- Few companies are created to develop technological innovations; the elite selection system does not favor the training of individuals who have a profile of discoverer.
- Many programs are doomed to failure because the marketing function is performed in an incomplete or imprecise manner through lack of rigor and this leads to unreliable results.
- The information is too closed unnecessarily (technological or economic) which is the raw material of technological watch which is a priori an important step for an innovation program, and also the absence of reliable statistics, even the supervisory ministry ignores the exact number of companies (almost twenty that arise and twenty that shut down each week), and even more those who innovate.
- Small and medium-sized companies only used their internal capacities which were limited and were unaware of the existence of means and technical support structures specially designed for them (communication problems, closed information). However, there were successes at company level (especially big ones) even with meager results, but they had a good start like SONEGAZ, SIDER and especially SNVI with a few patents on their account, (Table 1).

Year	Algeria	Tunisia	Morocco	Brazil	United States
1988	5	20	83	2338	75192
1989	4	26	60	2323	82370
1990	6	27	61	2389	90643
1991	6	26	55	2319	87955
1992	10	22	..	2100	92425

1993	8	42	42	2429	99955
1994	27	39	107	2269	107233
1995	28	31	89	2707	123962
1996	50	45	90	2611	106892
1997	34	41	..	2756	119214
1998	42	38	97	2491	134733
1999	36	67	..	2816	149251
2000	32	47	104	3179	164795
2001	51	22	..	3439	177513
2002	43	45	..	3481	184245
2003	30	35	..	3866	188941
2004	58	46	104	4044	189536
2005	59	56	140	4054	207867
2006	58	77	178	3956	221784
2007	84	76	150	4194	231588
2008	..	76	177	4280	231588
2009	..	105	135	4271	224912
2010	76	113	152	4228	241977
2011	94	137	169	4695	247750
2012	119	150	197	4798	268782
2013	118	112	316	4959	287831
2014	94	142	355	4659	285096
2015	89	180	224	4641	288335
2016	106	235	237	5200	295327
2017	149	172	198	5480	293904
2018	152	180	187	4980	285095

Table1. Comparison of the production of patents between Algeria and other countries.

The table above shows the gap between different economies (underdeveloped, emerging and advanced) in terms of patents. We can also see that even by comparing Algeria, a country so rich in natural resources (oil and gas especially), with other countries of the same level (technological, political life, security) such as Tunisia and the Morocco, the country is slightly behind, and stands out by a very weak evolution of the number throughout the period mentioned. The following table shows the approximate number of patents on behalf of companies, and the valuation may be worse (less), (Table 2).

Years	Patents
1988	0
1989	0
1990	0
1991	0
1992	1

1993	1
1994	3
1995	3
1996	5
1997	4
1998	4
1999	4
2000	3
2001	5
2002	4
2003	3
2004	6
2005	6
2006	5
2007	8
2008	0
2009	0
2010	7
2011	6
2012	3
2013	5
2014	5
2015	4
2016	1
2017	2
2018	4
2019	1
2020	0

Table 2. Patent filing for Algerian companies rough valuation according to reports from the ministry of Industry, and according to business surveys.

Thus, the figures show the weakness of Algerian companies in terms of innovation, and it is also the case of research centers and universities which suffer from the same problem. And the following table (Table 3) shows us the distribution of patents between the different state entities, and the figure mentioned is an accumulation of patents from 1988 until December 31, 2019, (Table 3).

Higher Education Institutions and Research Centers	Number of patent applications
Higher education institutions	139
Research centers of higher education	117
Research centers outside higher education	29

Research agencies of higher education	7
total	292

Table 3. Number of patent applications filed by Algerian national researchers.

Now, through Table 4, let's see what hides the section "Research centers outside higher education" from table 3, and which includes two large public companies, SONATRACH and SAIDAL, (Table 4).

Research centers outside higher education	Number of patent applications
Centre R&D SAIDAL	17
Algiers nuclear energy research center	3
Birine nuclear energy research center	3
Research Center in Maritime Fishing and Aquaculture	2
Center for Research and Integrated Studies in Building	2
SONATRACH R&D center	1
Pasteur institute	1
total	29

Table 4. Number of patent applications filed by Algerian national researchers concerning research centers outside higher education.

Algeria's national innovation system

The National Innovation System (NIS) has benefited from a sustained interest which is reflected in particular through an abundant literature (The first integrated approach of the NIS however comes from Lundvall).

The classic NIS diagram links three spheres: the productive sphere (the economic context and the industrial structure), the training sphere (training and the quality of human resources) and the research sphere (cooperation between companies and public research institutions).

However, for the designers of the NIS [3], the national aspect is central insofar as technological development and flows between firms appear more frequently within national borders than in relation to the outside.

Interactions are mainly between producers - users of innovations, coupled with special links between social and political institutions, and supported by national policies for the coordination and financing of R and D, (Figure 1).

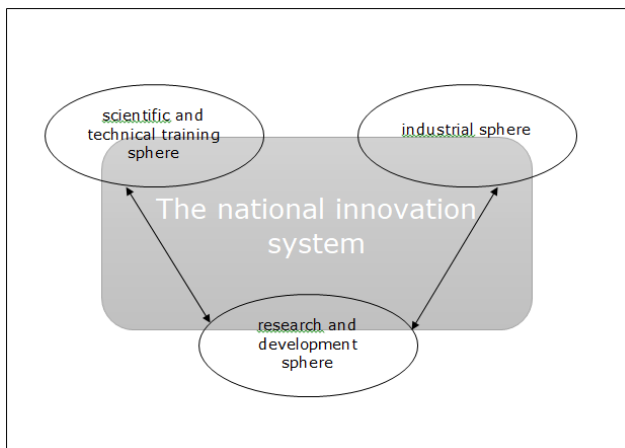


Figure 1: Basic diagram of the National Innovation System.

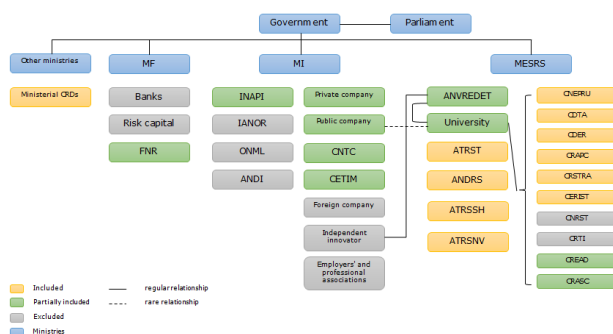


Figure 2: The national innovation system today: Inclusion and exclusion.

Results and Discussion

However, an examination of the current system in relation to complete, coherent and integrated innovation systems shows that of Algeria so far suffers from a number of shortcomings, namely [5]:

- Few operational links between the different components of the system in general, and we see that the private company is totally isolated from the rest, and as regards the public company, it very rarely establishes relations with the university.
 - Institutions that should be part of the system are only partially there (INAPI, ANVREDET)
 - Institutions totally excluded beyond their central administration, than by the innovation system (independent innovator, employer and professional association, etc.)
 - Missing institutions which normally aim to coordinate this system in its entirety such as the Hassan II Academy in Morocco, the KAIST (Korean Institute of Science and Technology)
- Nevertheless, the State (represented by the Ministry of Industry) and companies have deduced several causes of this failure.

State diagnostics

As we know that innovation is essentially a business job, the following observation developed from reports, studies and surveys by the ministry in charge of this case to provide a diagnosis concerning this idea [5];

- Consulting is a service little used by companies, the profile of managers far removed from the culture of marketing and a fortiori from innovation (entrepreneurship) and the organizational mode adopted as functional.
- In the absence of a clear innovation strategy, research activities for concrete innovation opportunities, in general in medium and small enterprises, and the stimulation of networking related to innovation do not constitute fundamental concerns of managers; to this end, the majority of companies do not have structures capable of generating new ideas.
- The pressure inherent in daily activities, the search for immediate profitability and the lack of interest in intangible investment constitute obstacles to innovation as a key factor of success.
- The attempted experiments in innovation launched in particular by public enterprises have not had any commercial follow-up; one of the most important causes is the phenomenon of discontinuity that has raged in the history of these companies (discontinuity in people and structures).
- Among innovative companies, rare those which have a reliable information system (watch) concerning new technologies.
- Algeria has invested colossal sums in human development; even that the percentage of students in science and technology is more than half, but the training provided is not adapted to the qualitative needs of the labour market.
- The research and development process has often been blocked for lack of incentive measures, and for lack of appropriate funding and in view of the difficulties in commercialisation the results; the relationship between the company and the university is far from sustained.
- The Algerian company rejects state aid by refusing to create a research and development entity (center or group) within it (the only condition decreed by law for the granting of funds). Then, the State promulgated a law in 2013 giving the possibility of creating mixed research entities, mixed with private and public resources to acclimatize the Algerian company to research and innovation activities, but this kind of assembly was very rare.

Companies diagnostics

The following points are made from interviews with executives from different structures such as R and D, business intelligence and several engineers from different disciplines, different types and forms of companies [6];

- Lack of strategies for innovation and this for the short or long term, so Business leaders are much more, if not absolutely for some companies, concerned only with turnover.
- Lack of dedicated R and D budget (only salaries and office supplies).
- There are no real R and D activities for some companies even if they have structures and researchers or / and engineers dedicated to these activities, and for certain sectors (especially pharmaceuticals) companies wait for an invention to become public.
- The quality of the graduates is scientifically acceptable, but the trainings do not meet their needs
- Companies are unaware of the existence of a national innovation system, and the university is rarely consulted and for some

companies never, and as for research projects (necessarily which go through ANVREDET or those proposed by the DGRSDT) the companies blame the bureaucracy which represents itself as a dissuasive factor to carry out research.

Synthesis

Indeed, many economists establish a link between the triptych, institutions, innovation and growth, and focus mainly on institutions which are "sets of habits of thought common to the generality of men". embodied by organized entities (the family, the firm, the State, the monetary system, etc.) which provide coalitions of individuals developing their own formal and informal coordination mechanisms, both to encourage and to limit the social and economic behaviours of individuals, and among these institutions the routinization of the perpetual processes of search for solutions to specific problems which leads to innovation [7]. Thus, there must be a certain environment, or called by others the rules of the game (institutions) which promotes innovation and generates a certain growth which will subsequently make it possible to perpetuate and increase quality of this triptych. The company tends to use its environment (innovation system) only to invest, for example, in all phases of technological creation; which can surely be explained by the fact that investments in the acquisition (appropriation) of production resources are less expensive than those devoted to the training of these resources. If institutional regulatory transformations are not enough to bring market, profit and property relations into line with the scientific power of production, no innovation can have the systemic scale it requires [5-6].

Conclusion

In addition to the obstacles to innovation mentioned above, structural problems rooted in people's daily lives, in general, very widespread in underdeveloped countries, such as the lack of justice, corruption. These pains prevent the good and fair distribution of wealth, and also all the beneficial socio-economic aspects (purchasing power, employment, economic growth, growth of state revenues, well-being) that could engender innovation. There is also a very serious technological (and scientific a priori) backwardness which, in my opinion, generates a lack of confidence among researchers and a great reluctance of decision-makers to engage in the quest for innovations or simply create new ideas. Finally, they

have to create to "stay in the race", speaking of companies, but there can be no sustainable creation without coexistence with routines. To create means to break with pre-established patterns, to manage one's own fear of the unknown by taking calculated risks of course, and to manage the conflicts, which the creative rupture will not fail to generate, with the supporters of rationalizing orthodoxy, which is embodied in organizational routines, as reassuring as they are rigid. The learning of agents within the firm is progressive and cumulative, and the speed with which agents develop new responses to new problems makes it possible to account for the firm's capacity to innovate. Collections of procedures, routines define both the culture of the firm and their ability to build their innovation and research programs. The future of the firm (or of an organization but also of a national economy) therefore depends greatly on its history and its present, which is to say on its ability to develop its own routines, distinct from other firms or economies.

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